

AMENDMENTS TO THE CLAIMS

The listing of claims below replaces all prior versions of claims in the application.

1. (Currently Amended): An evacuation apparatus for evacuating a process gas in a vacuum chamber of a substrate processing apparatus to produce a vacuum in said vacuum chamber, said evacuation apparatus comprising:

a booster pump connected to [[a]] said vacuum chamber, said booster pump having a pair of multistage Roots-type pump rotors comprising an inlet-side rotor and an outlet-side rotor, an axial width of said inlet-side rotor being larger than an axial width of said outlet-side rotor, said booster pump comprising a vacuum pump; and

a main pump connected to said booster pump, said main pump having a pair of multistage pump rotors, said main pump comprising a vacuum pump configured to be operable in a pressure range from an atmospheric pressure to a vacuum;

wherein said main pump is arranged downstream of said booster pump, and

wherein said booster pump has a pumping speed high enough to increase a pumping speed of said main pump

wherein said booster pump is arranged upstream of said main pump and configured to operate at a pumping speed larger than a pumping speed of said main pump such that the pumping speed of said booster pump is large enough to increase the pumping speed of said main pump.

2. (Cancelled).

3. (Previously Presented): An evacuation apparatus according to claim 1, wherein said booster pump is started after said main pump is started.

4. (Previously Presented): An evacuation apparatus according to claim 1, wherein a rotational speed of said multistage Roots-type pump rotors is controlled based on a temperature of a gas delivered by said evacuation apparatus, a pressure of the gas, a temperature of a rotor casing for housing said multistage Roots-type pump rotors, or electric current flowing into a motor for rotating said Roots-type multistage pump rotors.

5. (Previously Presented): An evacuating apparatus according to claim 1, wherein said booster pump and said main pump are accommodated in a single enclosure.

6. (Currently Amended): An evacuation apparatus according to claim 1, wherein said [[main]] booster pump includes a brushless DC motor.

7. (Withdrawn): A method of operating an evacuation apparatus having a booster pump connected to a vacuum chamber and a main pump connected to the booster pump, the booster pump having a pair of multistage pump rotors, said method comprising:
starting the main pump;

operating the main pump at a rated rotational speed;
starting the booster pump after a predetermined period of time has passed from said starting the main pump;
operating the booster pump at a constant rotational speed; and
when a pressure of a gas in the vacuum chamber is lowered to a predetermined pressure, increasing the rotational speed of the booster pump.

8. (Currently Amended): An evacuation apparatus according to claim 1, wherein ~~said multistage Roots type pump rotors are each two stage Roots type pump rotors having an inlet-side rotor and an outlet-side rotor, and a ratio of the [[an]] axial width of said inlet-side rotor to the [[an]] axial width of said outlet-side rotor is in a range of 2:1 to 10:1.~~

9. (Previously Presented): An evacuation apparatus according to claim 8, wherein the ratio is in a range of 5:1 to 10:1.

10. (New): An evacuation apparatus according to claim 1, wherein said pair of multistage pump rotors of said main pump comprises a pair of multistage screw-type pump rotors.